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IMPROVING HAND HYGIENE COMPLIANCE AMONG HEALTH CARE WORKERS IN AN INTENSIVE CARE UNIT

LEADERSHIP MANAGEMENT AND ENTERPRISE

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LIST OF ABBREVIATIONS

HCAI- Health Care Associated Infection

ABHR-Alcohol Based Hand Rub

WHO- World Health Organisation

HCW- Health Care worker

ICU- Intensive Care Unit

HH- Hand Hygiene

INTRODUCTION

Broffain et al. (2017) reported that health care associated infection (HCAI) may be caused by transmission of pathogen through the hand of health care workers (HCWs). This is responsible for increased health care cost, high mortality rate, disabilities and serious illness. Hand hygiene is considered as one of the most effective way to prevent HCAI (Mahfouz, El Gamal and Al Azriqi, 2013). Patients in intensive care units (ICUs) are most likely to get HCAI because of the common use of corticosteroid, antibiotics and invasive devices (Alsubaie et al 2013). About 25% to 50% of pt in ICU is affected by HCAI (WHO, 2009). To improve hand hygiene worldwide, many clinical guidelines have been created including the World Health Organisation (WHO) hand hygiene guidelines in 2009.

Through this dissertation, strategies to improve hand hygiene (HH) in an ICU, in a trust in Rodrigues Island are explored. Rodrigues Island is part of the Republic of Mauritius. The health budget for Rodrigues is increasing annually. A budget of Rs 11.6 billion is being allocated to health for Mauritius Schedule for the year 2017-2018. (budget.mof.gov.mu.org, 2017).

A systematic search was performed to find evidences to make this piece of work. It is composed of a literature review, a change proposal based on the literature review. An action plan follows and the feasibility of its implementation in the local context is widely explored.

SEARCH STRATEGY

To assess the contribution of existing literature on the topic of the dissertation, a literature review is done. To do the literature review, a systematic search was done to have access to the updated relevant evidence based articles. According to International Council for Nurses (ICN) code of ethics in 2012, nurses must do evidence based practice. Several search engines were visited. The articles were selected based on inclusion and exclusion criteria. No relevant literature was found on the topic for Mauritius and Rodrigues. Articles from many different countries were selected, especially those that show similarity issues to the local context.

It was not easy to select the topic among many others. After choosing the topic, there was a great need to formulate a research question, to be able to do the search. It is also important to know in which direction to go to make a good literature review. According to Santos, Pimenta and Nobre (2007), the 'PICO' must be used to formulate the question in order to ensure a brief and clear approach is used when searching databases. PICO was used also to construct the key terms used within the search process. (See Appendix 1 for more details). The research question for the literature review was: How to improve hand hygiene compliance among health care workers in intensive care unit?

Various electronic, online, search engine databases, such as Google scholar, ebscohost, Leeds Beckett online library and Google Search were visited. However, the quality of materials seen on the different search databases were not all academic evidence based materials. The Leeds Beckett database, 'Discover', was selected for the initial searches. There are lots of evidence based articles there concerning the chosen topic. The database 'Science Direct' and 'Google Search' were also used for more searches.

To view the articles from the databases, many different key terms were used such as 'hand hygiene compliance', 'health care workers',' hand hygiene', 'hand washing' and 'intensive care unit'. A basic search was done on the Leeds Beckett database Discover using the key term 'hand hygiene compliance'. 64,611 articles were found. However, this represented too many articles to do the literature review. An advanced search was done so as to refine and focus the search further toward the topic area. Inclusion and exclusion criteria were used to direct the search to the chosen topic. Boolean operator 'AND' was used to narrow the search and to find links that have a combination of the search terms (Itulu, 2016). Also, it directs to pages that contain all the search terms. 'Ti Title' was used for the term field so as to have a more focused and appropriate search. When 'Ti Title' was used, the articles are more specific to the topic area of dissertation. Other expanders and limiters were also used to narrow the search further.

The expanders were, applying related words to search within the full text of the articles and to apply equivalent subjects. Among the limiters, full text, academic journal and scholarly peer reviewed articles were selected. Non peer review articles are non scholarly and were not reviewed by impartial peers (Smith, 2016). The language chosen for the articles was English only. The articles were limited by date, to the last five years. However, the search was narrowed to seven articles only. More articles were needed for the purpose of doing the literature review.

Most of the papers among the seven articles selected were concerned with WHO (2009) HH guidelines or multimodal strategies or 5 moments of HH. So, the search was limited to dates as from 2009 onwards. More articles were selected, a total of 15 articles were among the refined searches. Although full text was selected as limiter, two of the articles were rejected as one of them was an abstract and the other one an introduction of an article. So, 13 articles from the advanced search were used for the literature review. To further increase the depth of the discussion, 6 other articles was selected from the Leeds Beckett online database, discover and science direct.

A basic search was done using the same key words as above two articles were found. Two were chosen through hand search within the 64, 611 articles found. Two others were selected through reading the bibliography of the 13 articles and the references within their text. This sum up to the six articles that is 19 articles were chosen from Leeds Beckett online library, including some via the science direct database. As the WHO (2009) Guidelines were cited within the different articles, the guideline was searched via Google Search.

Twenty articles in all were used to make the literature review. The main subject area chosen for the search were intensive care unit. Among the main exclusion criteria were duplication of articles and articles older than 2009. Articles that were in English language, scholarly peer reviewed and academic journals were among the main inclusion criteria. (See also screenshots in the appendix).

LITERATURE REVIEW

Among the various guidelines for hand hygiene, that for WHO has been influential for HCWs. The WHO (2009) multimodal strategies as well as the 5 moments for HH have given rise to many researches. The WHO (2009) guideline was designed, based on guidelines and expertise from other infection control guidelines. It was graded using the system developed by Centre for Disease Control. The direct observational study designed by the WHO in 2009 has even been used as audit tool worldwide. The WHO proposed multimodal strategy for the improvement of HH compliance in health services (Broftain et al, 2017). It focuses on:

i. Training and education for staff.

ii. System change: Putting emphasis on availability of facilities for appropriate hand hygiene

iii. Monitoring, auditing and performance feedback and evaluation

iv. Reminders at the workplace (verbal, nonverbal and others)

v. Safety climate in the institution; involving individual and institutional active participants.

i. Training and education for staff.

From a direct observational study done by Mahfouz et al. (2014) in Saudi Arabia, it is stated that regular training and education must be provided to improve HH compliance. The training and education must be focussed on the importance of hand hygiene. Staff must be familiar with the multimodal strategies and 5 moments of HH of the WHO (2009) guideline. The 5 moments of HH put forward by the WHO are indicated as follows:

i. Prior to contact with patient

ii. Prior to clean and aseptic procedures

iii. Following contact with body fluids

iv. Following contact with patient

v. Following contact with the surroundings of patient

Compliance rate before contact with patient and before clean and aseptic procedures were usually lower compared with the compliance after contact with body fluid (Mahfouz et al., 2014). Staffs think that contacts with body fluid are high risk for them that are why the compliance rate is higher (Alsubaie et al, 2013).

In a comparative and observational study done by Sunkesula et al. (2015), comparison of HH monitoring was done between the 5 moments for HH of WHO against the two moments, wash in and wash out method. The wash in and wash out method involves washing the hands before entering the patient cubicle and when leaving the cubicle. The study was done at VA Medical Centre, Cleaveland, by studying 383 HCWs. Both methods were used simultaneously. The result shows that overall rate of HH compliance was same for both methods.

However, it is seen that my 5 moment of HH approach is better for education of HCWs. It provides good indication, showing with evidence when hand hygiene is really required. However, the wash-in-wash-out method missed some opportunities. It is not indicated for example before aseptic procedure is done and after contact with soiled body fluids. Mahfouz et al (2014) stated that compliance rate increases after people have received training and applied the 5 moments of HH method. The wash in and wash out method was also seen to be an acceptable method for monitoring compliance (Sunkesula et al, 2015).

It is important for HCWs to do proper hand hygiene (Koff et al., 2011). Hands are easily contaminated again after cleansing. Pathogens are transmitted in unclean environment (Gould, 2010). Hands of HCWs play major roles in the transmission of microbes from one patient to another. From an international study, done in a mixed surgical and medical ICU, samples were collected from the hands of HCWs before and after hand hygiene. 300 cultures were obtained from 20 nurse assistants, 17 physicians and 32 nurses. Staphylococus epidermitis were the most available microbes that were cultured from the hands of those workers (Hossein and Sajjad, 2009). Methicillin-resistant Staphylococcus aureus is common in ICU. It is a worldwide cause of nasocimical infection (Hitoto et al., 2011).

From a prospective study done by Findik et al. (2011), hand flora of 60 ICU nurses was swabbed and culture of micro organisms was done. Post shift, Enterobacter Cloacae was the micro organism isolated. It is bacterium which is well available in blood, urine and phlegm. Unfortunately, HH is mostly done when hands are visibly soiled (WHO, 2009).

Hand hygiene awareness program can improve compliance (Biswal et al., 2013). It was self reported that poor adherence to HH occurs due to lack of knowledge of guidelines or HCWs don't know protocols. Lack of knowledge, expertise and education are also barriers to proper hand hygiene (WHO, 2009). All aggressive continuous education programs can improve hand hygiene compliance (Mahfouz et al., 2014). Poor compliance of HH can be due to lack of certain facilities at the work place.

ii. System change

Many facilities must be made available for proper hand hygiene. It was also self reported that poor adherence with HH are caused by lack of water supply, soap and paper towel. It may also be due to shortage of sink or it may be incorrectly placed. There are problems associated with the use of hand hygiene agents which resulted to reduce compliance. Hand hygiene agent was reported to cause irritation and dryness to the skin of the hand (WHO, 2009).

The national HH guidelines in Germany recommend HCWs to use alcohol based hand rub (ABHR) for all opportunities. According to the guidelines, ABHR must only not be used in case of patients having clostridium difficile diarrhoea, where it is recommended to use ABHR followed by hand washing (Wetzker et al., 2017).

According to Findik et al. (2011), in a prospective study done on 60 ICU nurses, 65% of nurses preferred to use ABHR. Also, 95% of them preferred to use paper towels to dry hands. The use of paper towels instead of reuse cloth towels reduces contamination. They also stated that paper towels and ABHR facilities must be always available in ICUs.

Hand washing may cause skin irritation and it is time consuming to hand wash. Though it is considered as gold standard, it is preferable to use alcohol based agents than soap and water. Alcohol based agents is more effective in reducing bacterial contents from hands (Thomas et al., 2009). ABHR containing 75 to 85% ethanol or isopropanol or in combination are effective agents. Formulation containing either 80% ethanol or 25% isopropanol is recommended by WHO (2009).

In the observational study done by Thomas et al. (2009), it was found that the variation in the placement of ABHR, affect HH compliance. It was found that HH compliance improve when ABHR facilities were placed as close to the patient as possible.

In another study, combining three methods, interviews, observation of workflow and electronic measurements of ABHR dispenser usage, the results show that both nurses and doctors prefer the ABHR placed close to the sink as some nurses used soap and water together with ABHR. It is also recommended to have no obstacle between ABHR dispenser and the HCWs (Booge et al., 2013). Compliance to HH have been shown to be improve when personal devices for ABHR are available (Koff et al., 2011).

A physician mentioned that the ABHR dispenser must be placed in the patient's cubicle, on the right side, as patients are normally examined on the right hand side. For a nurse, it must be placed close to the patients as they can perform hand rub when multiple procedures are done simultaneously to a patient (Boog et al., 2013).

When hands are visibly soiled, it is advisable to wash the hands otherwise. Alcohol based hand rub is advised (WHO, 2009). When taps are operated with elbows are not available, paper towels may be used to operate or turn off faucet (Boog et al., 2013). Sink, water, paper towels and ABHR must be made accessible to HCWs (Gould, 2010). In addition to those facilities, the compliance rate must be monitored.

iii. Monitoring, auditing, performance feedback and evaluation

Hand hygiene practices, as well as infrastructures for proper hand hygiene must be closely monitored to improve HH compliance. The knowledge of HCWs and their perception about HH should also be monitored. Performance and result feedback must also be communicated to them (WHO, 2009).

The infection control and prevention teams and managers are responsible to ensure that the appropriate methods of HH audit and performance feedback are used in health services. The communication of result encourages them to improve their practice (Gould, 2010). Lack of reward and encouragement was self reported as factors contributing to poor adherence to hand hygiene (WHO, 2009). There are various methods of auditing HH; such as self report, direct observation, product uptake and electronic monitoring devices.

In a study done by Findik et al. (2011), a three method, including collection of sample from hand flora of 60 ICU nurses. This method is called the bag broth method. Self reported questionnaires were also filled by nurses. The nurses have reported to wash their hands according to guidelines. The results show that high rates of micro organisms were present on the hands of health care workers post shift. The self reported rates of hand washing were 65-93% pre shift, and 96-100% after patient care procedures. The micro organisms Enterobacter faecalis, alpha haemolytic streptococcus and methilicilin-sensitive staphylococcus aureus were among those isolated pre shift and post shift. Enterobacter cloacae were the only species present after, but not before the shift started.

Although they have stated to wash their hands correctly according to guidelines, it was shown that many and different species of micro organisms were present post shift on the hand flora of the nurses. This shows that the self reported method is not a reliable one for auditing, as the HCWs mostly over estimate their actions (Gould, 2010).

The Direct observational method is the most usual method used for auditing. It is considered as 'the gold standard' method for auditing hand hygiene (WHO, 2009). It facilitates the monitoring; the hand hygiene product use; compliance according to guidelines; environmental barrier to HH and thoroughness of cleansing (Gould, 2010). Its drawback is the Hawthorne effect. The compliance rate increases when using the direct observational study. After the long time presence of foreigner in ICU, though disguised, the workers notice that they are being observed and alter their behaviours (Findik et al., 2011).

The closed circuit circle television (CCTV) monitoring system is also seen to be a reliable method for observation of hand hygiene. Broftain et al. (2017) proposed to replace the direct observational method with CCTV, as it helps to eliminate the Hawthorne Effect. This conclusion was drawn as a result of the cross sectional study done using continuous CCTV against covert observation in a general ICU. 30 registered nurses, 6 physicians and auxiliary nurses were studied in a 16 beds ICU in Israel. However, the sample size is small and only one centre was used, which makes it difficult to generalise the results.

Product uptake is a cheap method to audit hand hygiene. The method is used to measure the volume or weight of liquid soap and disinfectants used over time. It is less time consuming and do not require great expertise from the part of the auditors (Gould, 2010). In a comparison study done to compare direct observational versus calculated dinfectant usage, compliance was 2.75- fold more elevated for direct observation (Scheithauer et al., 2009). However, information concerning the quality of HH performed cannot be recognised when monitoring product uptake (Gould, 2010), other electronic monitoring devices may be used. Electronic signal colour hand disinfectant dispensers were put under investigation in Germany to assess HH compliance in a medical ICU. After using the device, compliance rate among staff increased by 6%. This electronic device was shown in the study to be useful to measure compliance (Scheithauer et al., 2014). Unfortunately, electronic devices are expensive to maintain and to buy, and also poor compliance cannot be corrected (Gould, 2010).

Hand hygiene compliance rate must be monitored on a monthly basis. The result must be provided to the concerned staff and leaders in hospitals (Mahfouz et al., 2014). Performance feedback is very effective in HCAI prevention (Barrera et al., 2011). Regular feedback of HH compliance and rate of infection can help to know problems that might usually occur. Feedback allows the HCWs and managers to know about hand hygiene non compliance in advance, so as to prevent them. Feedback can be given individually or verbally, in group. It may also be displayed on posters (Gould, 2010). Sanctions must be given to non compliers, and rewards to compliers (WHO, 2009).

iv. Reminders at the workplace

HCWs should be reminded about the importance of hand hygiene. They must also be reminded about indications and procedure. This can improve their practice (WHO, 2009). The materials used as reminder can be poster, or even computer screen savers.

In a direct observational study done by Mahfouz et al. (2014), posters were put in strategic places to intensify reminders. They are placed like for example, near sinks used for hand washing, near beds and even in consultation rooms. They are strategic places where the staffs usually have contact with patients.

Reminders may also be placed on glass doors or windows. Words were written on the glasses in an ICU to inform the staff to wash hands before and after touching the patients (Sahay et al., 2010).

When ABHR dispensers are places on the walking route of staff, it reminds them to disinfect their hands (Boog et al., 2013).

The senior HCWs act as role models to remind junior ones (Hitoto et al., 2011). Gilbert et al. (2009) reported that physicians were found to have lower HH compared to nurse. Physician compliance rate is low in much study. Such negative role models can be reflected in medical students' performance to do hand hygiene. According to certain physician belief, the evidence for prevention of HCAI by HH is not reliable, this answers the result of their usual poor compliance (Hitoto et al., 2009).

v. Safety climate in the institution

Hand hygiene can be improved in favourable environment, which prioritises patient safety. Institutions must prioritise hand hygiene. The individual, as well as the institution must actively participate for safe HH practices (WHO, 2009). The individual and institution must be constantly improving and changing. Staff and hospital leaders can sit together to explore the barriers to safe practice. That way, they have solutions for the various problems (Gould, 2010). Leaders must be involved in hand hygiene improvement programme; for example, they can actively participate in hand hygiene day (Mahfouz et al., 2014).

In Berrera et al. (2011) study, the low nurse to patient ratio was independently associated with central line-associated blood stream infection. Hand hygiene plays a major role in the prevention of transmission of the central line associated infection. Understaffing is a worldwide problem, and it is considered as a key determinant of HCAI in ICUs. Staffs have less time to do proper hand hygiene.

Day shift workers are more compliant than night shift workers on ICU (Alsubaie et al., 2013). It is also noted by Sahay et al. (2010) that there is significant variation in compliance of HH for HCWs during day duties. When staff freshly arrives at workplace, they are more compliant, maybe along the shift they get exhausted. The HH rate lowers during the shift. HCWs must adhere to guidelines for HH, disregard to the time of the day (Sahay et al., 2010).

Many HCWs wear jewellery like watches, rings and others. Those items can be contaminated with pathogens. The removal of jewelleries is recommended for proper hand hygiene (Biswal et al., 2013). Both the individual and the institution must contribute to patient safety by giving patient centred care.

Hand hygiene is found to be an effective way to reduce HCAI. Hand hygiene compliance is still low in many ICUs (Biswal et al., 2013). HCWs must continue to improve the practice of HH for the best interest of the patient (WHO, 2009). Environment around patient must be regularly cleaned to improve patient care (Mahfouz, El Gamal and Al-Azraqi, 2013).

PROBLEM STATEMENT AND THE NEED FOR CHANGE

As it has been seen throughout the literature review, hand hygiene non compliance is a worldwide problem, which leads to the burden HCAI. There are many reasons for non compliance. People may not comply with HH protocol, usually due to lack of proper education and knowledge about the right practices. Also, it may happen due to lack of facilities such as soap, water, sinks and paper towels. Lack of reminder at the workplace may also lead to non adherence with hand hygiene. Patients may not be monitored enough on the proper hand hygiene technique, so they don't know whether they are doing good practice or not.

Furthermore, the individual and the institution do not participate actively enough in hand hygiene promotion (WHO, 2009). These are among the barriers worldwide that lead to non compliance to HH, in Rodrigues also, there is the need for change in the practice of hand hygiene. There are some problems in that practice area among HCWs. The ICU in that trust in Rodrigues is a general, mixed medical, surgical, neurological ICU. Males, females, adults and children are also admitted in the ICU. It is composed of 6 beds. However, when questions are asked to staff about hand hygiene, some have been found to have poor knowledge, some are sceptic about its values and some think that they have not enough time to perform it well. Others say that there is lack of facilities to do it well. It has been self reported by staff of the ICU as well that the product used for hand hygiene causes problems tot the skin of their hands such as dryness and irritations. There are no guidelines, and reminders like posters in the ICU. The staff in the ICU has self reported that they have never been monitored to know whether they are doing the practice well. They believe that there is a lack of consideration from the part of the institution for hand hygiene.

Moreover, people are getting more and more infections in the ICU. Two or more patients in the recent years have received ventilator associated pneumonia. The length of stay for patient is longer than expected. The detergent and alcohol hand rub dispensers are usually empty and dirty. The nurse to patient ratio is never respected. Three nurses care for six patients. Attitudes of staff towards HH are not always positive. Is there a need for change?

CHANGE PROPOSAL

As there are some problems in the ICU, there is a need for change. To make the change, some ideas need to be proposed. Nurses may change their practice of HH in that unit for their safety and patient safety. Also, to reduce that burden, HCAI, nurses must do a patient centred care (McClung et al., 2017). Since it is stated by ICN (2012) Code of Ethics for nurses that nurses must do updated and evidence based practice, evidence from the literature review including guidelines by WHO will be used to bring the change. The WHO guidelines are considered as evidence based. It is nurses' responsibility to promote health by doing safe practice (ICN, 2012).

The ICU is a six bed, generally mixed one. So, ideas from around the world as shown in the different studies are welcome. To promote the health and safety patients and staff in the ICU, a change proposal is made as follows:

1. *Education and training*

To improve education and training of staff, guidelines must be made available in the unit. Continuous education about the importance of HH, proper HH and updated techniques must be given to HCWs. According to Manfouz al. 2014, continuous education can improve hand hygiene. An awareness campaign needs to be done to boost the knowledge of the staff. More support must be gained from the institution to favour education. HCWs must know the activities that give rise to contamination of hands and also when and why hands must be clean. Information must also be provided on infection control. They must be aware of the different methods for hand hygiene as shown in appendix 3 (WHO, 2009).

2. *System change: provide adequate facilities to staff*

All facilities must be provided to staff so as to do hand hygiene well. The building must be evaluated to know which facilities are missing. Only two sinks are available in the building. Two or more additional sinks should be made available. There are two different points which have already been spotted in the unit where to place the sinks as the water supply is already available there. Other facilities like paper towels and soap should be made available.

Additional ABHR dispenser should be made available as there are only three in the unit. The dispenser must be regularly cleaned and refilled. Auditors will make sure that the dispenser is refilled as required. There should be no obstacle between the staff and the ABHR dispenser (Gould, 2010). If wall mounted dispensers are difficult to fix, the dispensers should be put on tables, close to each patients' bed. Also, mini personal pocket hand sanitizers should be given to patients. Personal hand sanitizers promote compliance (Koff, et al., 2010). It may also act as a reminder.

A survey must be done to know which products for HH are safer for staff. Evaluation to be done will determine which products wanted by staff for proper hand hygiene. All safe HH products must be made available at all times in the unit.

3. Monitoring, auditing, evaluation and performance feedback

Gould (2010) also recommended that HH practice must be continuously monitored to know whether staffs are doing it well. Performance feedback must be given to the staff monthly so as to know where to improve. A pilot test for hand hygiene must be done. A pilot study is a small scale test, prior to full implementation of the programme (Leon, Davis and Kraemer, 2011). Then, auditing of the practice will be done regularly using self reported questionnaire, product uptake and the auditor will be trained to do other direct observation as requested by WHO. The direct observational study is gold standard; though each method has their drawbacks (WHO, 2009). The rewards are to be given to staff that perform well and additional education to be given to non complier.

4. Reminders at the work place

As there is a lack of reminders, there is the immediate need to propose some to the unit. The reminders must be found in those strategic places, where staff usually has contact with patients. Posters showing HH techniques to be place in strategic places as showed in the study of Mahfouz et al. (2014). And also, the hand rub dispenser should be on the way of staff to act as a reminder. The senior staff should be well trained and encouraged to perform well, as they may act as role models and reminders to junior ones.

5. Safety climate of the institution

Staff must work in team. Team spirit should be developed among staff. Hand hygiene day should be organised. Prizes should be given to compliers at the same time, meeting with staff to develop that team spirit. The individual, as well as the institution must be responsible and accountable for proper hand hygiene. Participation of the leaders is important for proper hand hygiene (Mahfouz et al., 2014).

Leaders of the hospital must participate actively with health care workers to promote that team spirit needed to promote hand hygiene. The staff will feel more concerned when they feel supported in the endeavour.

The ICU should never be understaffed (Berrera et al., 2011). The charge nurse who acts as the ward manager must ensure the nurse to patient ratio is respected at all times. It is the institutional responsibility to make sure that HH is done correctly by staff (Findik et al., 2011). Staff should also be aware of how to reduce HCAI, for example, not to wear jewellery like watches, rings for proper hand hygiene. Both at institutional and individual level, they must participate to improve that area off practice. The outcome should be staff satisfaction and patient safety.

THE SWOT ANALYSIS

SWOT refers to 1) strength for the‘s’; 2) weakness for the ‘w’; 3) opportunities for the ‘o’; and threat for the‘t’. It is a method used for the formulation of strategy. It is mainly used to identify the strengths and opportunities, as well as the weaknesses and threats before designing the change plan. It is also used to have a full awareness of the situation, to identify barriers and other factors that may affect the change process. Hence, negative factors can be removed before, so as to better implement the change (Bull et al., 2016). See also the SWOT analysis in the Appendix 2.

ACTION PLAN

According to WHO (2009) HH guidelines, whenever improvement for HH needs to be done, an action plan needs to be done. The WHO proposed to develop a 5 years (minimum) plan. For the improvement of HH in the ICU, in that trust in Rodrigues, an action plan is made based on evidence from WHO guidelines and other evidences in the literature review (See the action plan in the Appendix 3). The proposed plan would be used as a pilot test for six months and would be updated (extended) for five years with respect to WHO guidelines. The continuation of the programme will depend on the success of the implementation of the proposed action plan.

LEADERSHIP AND MANAGEMENT

It is very important to continually improve and update the health care practices. Implementation of change is difficult, but it is very important for the promotion of the service (Mitchell, 2013). Without leadership and management, it is very difficult for an organisation to progress or to make change (Swanwick and Mckimm, 2011). Although the teams are usually used interchangeably, they are different and complementary. But, both are important for the wellness of the organisation.

Management is most engaged with complexity whereas leadership is engaged with change. Managers have subordinates whereas leaders have followers. It is therefore dangerous to separate the two. An organisation which is 'under led' but over managed does not flourish. Leadership also refers to how leaders deal with employees. Effective leadership requires the leader to progressively directing and guiding his followers to direction expected by all members of a group (Bhatti et al., 2012).

Leadership also refers to the process via which a leader influences the group of people towards a common goal (Hussein et al., 2017). Clinical leadership engages HCWs in setting direction as well as effecting or implementing change (Swanwick and Mckimm, 2011). There are different types of leadership; the 'laisser faire', autocratic and democratic styles. Leadership type is essential for the change process of organisations (Hussein et al., 2017. Those styles of leadership were firstly discovered by Lewin, Lippit and White (1939). The other types of leadership are transformational, transactional and situational leadership (Vann, Coleman and Simpson, n.d.).

Transformational leadership is also partly 'laisser faire' and partly transactional (Fisher, 2016). Transformational leaders are charismatic. They favour innovation. The followers and leaders have intimate relationships. The transformational leadership identifies the partners for change process. However, in order to improve patient outcomes, the transformational leadership style should be used with other methods (Fisher, 2016). Transformational leaders focus on the development and personal needs of followers. The transactional leadership is task oriented form of leadership; which deal mostly with managing followers. They emphasise on achieving results rather than change. They also believe that workers should be closely monitored to achieve results (Vann, Coleman and Simpson, n.d.). Followers are motivated to work through reward and punishment (Bass, 1985; Hussain et al., 2017).

The 'laisser faire' style of leadership does not have a specific way to reach goals and the followers are completely free (Bhatti et al., 2012). Due to the passive nature of leadership and the complete freedom of followers, they are less motivated and surely the least productive (Vann, Coleman and Simpson, n.d.). Furthermore, the autocratic leaders believed that there must be a clear demarcation amidst leaders and followers. Most decisions are taken by leaders. They are power oriented (Lewin, Lippit and White, 1939). The organisation may be highly productive, but workers are least motivated to work under other forms of leadership (Vann, Coleman and Simpson, n.d.). Through the autocratic leadership style, followers are also least satisfied (Rustin and Armstrong, 2012).

Another form of leadership is the democratic style which was first discovered by Lewin and Lippit in the 1930s (Rustin and Armstrong, 2012). In this type of leadership, followers are invited to participate in the decision making process, although the final decision is kept by the leader (Bhatti et al., 2012). The democratic leaders participate with the followers (Rustin and Armstrong, 2012). There is increasing job satisfaction, and also followers are more motivated to work than under other styles of leadership. It is most effective when team work is required (Bhatti et al., 2012).

Amidst those styles of leadership, such as ‘laisser faire’, democratic and authoritarian, this style of leadership is the most effective (Rustin and Armstrong, 2012). According to Bhatti et al. (2012), there is no type of leadership which is considered as the best. The effectiveness of a specific style of leadership depends on the context of the organisation (Bhatti et al., 2012).

Management on the other side is also considered as an academic discipline as well as a social science. Management incorporates leading, planning, staffing, organising, guiding, as well as controlling an organisation to meet the expected goal and target (Pierce and Horkings, 2016). Structure and direction are required to manage the change process (Hussain et al., 2017). Both leadership and management are required to make change in an organisation.

CHANGE THEORY MODELS

According to Ellis (2013), managing change involves adopting the latest evidence to improve and produce better results. It can be however difficult to effect changes despite the constant need to change and improve practices. To enhance chances of success, putting into practice a change theory model may be helpful. The change allows for identification of change agent of effective steps to be implemented before actually proceeding to the change (Mitchell, 2013).

There are different change theory models such as Lewin's three step change model, the Kotter's eight steps model of change, and the Lippitt's phases of change theory model. Those theories are among those which are the most recognised among the various change models (Kritsonis, 2005).

The Kotter's (1996) 8 steps model of change is composed of eight different steps. It is a clear framework which can help to direct change. The first step of the model is to act with urgency; as people are frightened to make change. The second step is to develop the guiding team spirit. Individuals cannot make change alone. Thirdly, it is required to show a change vision. Fourthly, the vision must be communicated to others. The fifth stage is to empower broad based action. It is the step where the workers make the change process on their own. The sixth part is to produce short term wins, which correspond to rapid and strongly visible change. The seventh step is to improve the visibility which was created through step six. And the last part, the eighth step is to stick to change, that is, to adopt the new vision and behaviour of change (Kotter, 1996; Wheeler and Holmes, 2017). However, according to Hoogendom (2013), the Kotter's model is seen as non flexible and rigid. It does not require staff involvement to make the change possible. The other drawback seen by Hoogendoom (2013) is that none of the steps can be skipped; otherwise the change would be impossible.

The Lewin's (1951) change model is one of the most famously used models to implement change (Mitchell, 2013). This organisational change model has three steps, namely the unfreezing, secondly the movement or changing step, and the refreezing step (Kritsonis, 2005; Hussain et al., 2016). According to Hussain et al. (2016) for an organisational change to be successful, it may be planned. Hence, in order to achieve that, the system must be unfreezed. The unfreeze step is concerned with breaking the existing habit, to motivate people to make change, to recognise the need for change, to build trust and to fight against resistance of change.

The second step of this model is changing or movement stage which deal with changing the behaviour of people. The change of behaviour leads to a new level of equilibrium. Group discussion is favoured during this stage. During this step, the staff must see and accept new perspectives. It consists of group work, meeting with leaders, as well as giving support to change (Kritsonis, 2005).

Thirdly, it is the refreezing stage. This happens after the change has been undertaken. However, employees may revert to their previous bad behaviour. The new equilibrium must be stabilised to avoid that. It may be done by balancing the two opposite forces, restraining and driving forces where forces can either promote or hinder change (Kritsonis, 2005). Unfortunately, it is seen by Hoogendoom (2013) that during the refreezing stage, there is no flexibility as change should be a continuous process.

The Lippitt, Watson and Westley (1958) phases of change theory model is an extension of Lewin's formerly mentioned model. It has seven steps. Its focus is mainly on the responsibility and role of change agent. Furthermore, less emphasis is put on the evolution of change as in Lewin's model. The theory model of change is used as a testimony because change is a real phenomenon, which can be analysed and seen via several phases, a steps or stages (Kritsonis, 2005). The theories are important for the success of the change process.

CHANGE PROCESS

People would take conscience to change their practice of hand hygiene only if they have a severe HCAI (Grol and Grimshaw, 2013). The process of change within an organisation is to move from a known or current state to an unknown, new desired state (Cumming and Worley, 2003). Leadership is also an important part of the change process. Sharing knowledge and staff involvement are also key factors in the change process (Hussain et al., 2017).

To manage the change process, resources must be available, presence of the change agents, a modern leadership, good structures, political and interpersonal skills are required (Beck and Harris, 1987). The role of the change agent is played by leadership in Lewin's model of change during the unfreezing phase. Transformational leadership style has a positive effect in organisational change process (Hussain et al., 2017).

Teamwork increases staff motivation (Swanwick and Mckimm, 2011). The leader and the staff must be one entity for the Lewin model to be effective in bringing change (Hussain et al., 2017). Democratic leaders encourage teamwork (Bhatti et al., 2012). A transformational leader is charismatic and is best effective combined with other leadership styles. By combining the democratic and transformational leadership together and the Lewin's 3 step theory model, the improvement of the hand hygiene may be successful. One more factor that may affect the change process is resistance to change (Bordia et al., 2004). The unfreezing stage of the Lewin model is to fight against resistance (Kritsonis, 2005). It is important to fight resistance. Good team work and good leadership are also what are required to make the success of the change process (Hussain et al., 2017).

FEASIBILITY OF IMPLEMENTATION OF THE ACTION PLAN

There are many factors that may affect the implementation of the action plan, such as resistance to change, time limitation, cost of implementation and failure due to unexpected circumstances. People fear to make changes. Not many organisational change programmes have been successful, and not so many as well have completely failed (Kotter and Schlesinger, 2008).

According to Kotter and Schlesinger (2008) human resistance is also often the most common cause of failure to make change. This can be overcome only through education and communication programme, through negotiation and by providing adequate facilities and support to staff. The change programme is costly, but the trust received government support for its project. The acting ward manager has only to make requests for the required needs. The health service in Mauritius and Rodrigues is free of cost, financed by taxpayers' money (Budget.mof.gov.mu.org, 2017)

The acting ward manager must request for additional staff to improve the nurse to patient ratio. Bank nurse scheme already exists in Rodrigues. Bank nurse scheme can solve the understaffed problem. The additional nurse can also act in incognito as auditor. With increased amount of staff, nurses will have more time to devote to hand hygiene. The new acting ward manager is very charismatic. He also has the quality of a democratic leader. He has already created team work approach in the unit. Team spirit is already a value of the Rodriguan culture. The acting ward manager, together with the team leader can work together to continuously negotiate with the hospital leader to have their maximum support. The support of the leader is a priority for the success of the change implementation programme.

REFLECTION

Reflection refers to the capacity to comprehend and learn from actual actions. As a consequence, states of mind and action courses are modified to reach the forecast standard practices (John, 1995). As part of the Bsc (Hons) Adult Nursing course, I had to do a dissertation, to fulfil the requirement of the course. I also had to end the dissertation by doing a reflection, using John (1995) model.

To write a dissertation of 8000 words is not an easy task. But, it is important to do the dissertation, so as to complete the course, and also to succeed. Doing a reflection on action after overcoming all the different steps to reach the 8000 words, reminded me of the difficulties I encountered. My principle objective was to succeed. It also required me to acquire knowledge through the literature search I did to write the dissertation, so as to better care for the patient. I react that way as the nursing profession is becoming more challenging today. It requires nurses to do continuous learning to give updated evidence based practice to patients (ICN 2012).

I knew that if I did my best in the dissertation, I could succeed. My success could also allow me to do more advanced study in nursing and give best care to patients. However, if I fail the dissertation, my dream could also fail. I was so frightened in the idea of not giving my best in that final piece of work. If I did wrong, failure is sure.

I felt demotivated. The poor internet access also demotivated me more. Time was going on, my work was late. The poor internet access did not allow me to reach the target set for my dissertation at times. I did my best to do the maximum part of my work when the internet was okay.

The precious information I received through my searches on the topic HH was a good motivation which encourage me to continue with my piece of writing. I found new evidences, to better care for patients. The other students doing the Bsc Course was my great support. They told me about the same difficulties they were encountering while writing the dissertation. They kept on encouraging me to do my best. Their approach was so sincere that I was motivated to continue to write the dissertation again and again.

I should have kept the idea of providing safer care to patients as a motivation when I was discouraged. Taking some leaves were also an alternative, to have more time to devote to my piece of writing. But, I realised that it was impossible to continuously take leaves as there was a shortage of staff in the unit where I was working. The other option was to do the work at home and very late overnight. However, I had to give more time to my dissertation and less time to my family and my sleeping time. Little sleep can also affect my health, because I had to do extra night shift to complement the shortage of staff at work too. This put me in a dilemma.

This experience reminded me of my past studies, which I completed successfully although they were also tough. This also reminded me that no study is easy. I had to work hard to complete the dissertation to succeed and to be able to do further advanced courses in the future.

I'm proud to have completed the piece of work and expect success from it. Through the process of writing the dissertation, I received more knowledge on hand hygiene. I now know how to improve hand hygiene compliance. I also know now that I have to use this knowledge to improve patient care. I encourage other colleagues in my unit to continue to learn like me so as to improve patient care in the unit.

CONCLUSION

The strategy used to improve HH practice must be evidence based one, such as using the WHO strategies from the 2009 HH guidelines. However, the guidelines are dated from 2009. There are new challenges in clinical practice. It is required to be updated as stated in the guidelines book. New evidences were found in the other articles while doing the literature review. HCWs must follow guidelines to improve HH practices. Many other things are required as well. There are different approaches that are required to make change in that particular area of practice.

Good leadership and management are greatly required to make the change possible. Teamwork and awareness campaign are among the priorities. Adequate facilities must also be put at the hand of the HCWs to improve hand hygiene. By improving hand hygiene, HCAIs would also be reduced. Improvement of hand hygiene compliance could only be achieves through multiple strategic action. Safety of patient is a priority (WHO, 2009).

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APPENDICES

Appendix 1: Search strategy

P	I	C	O

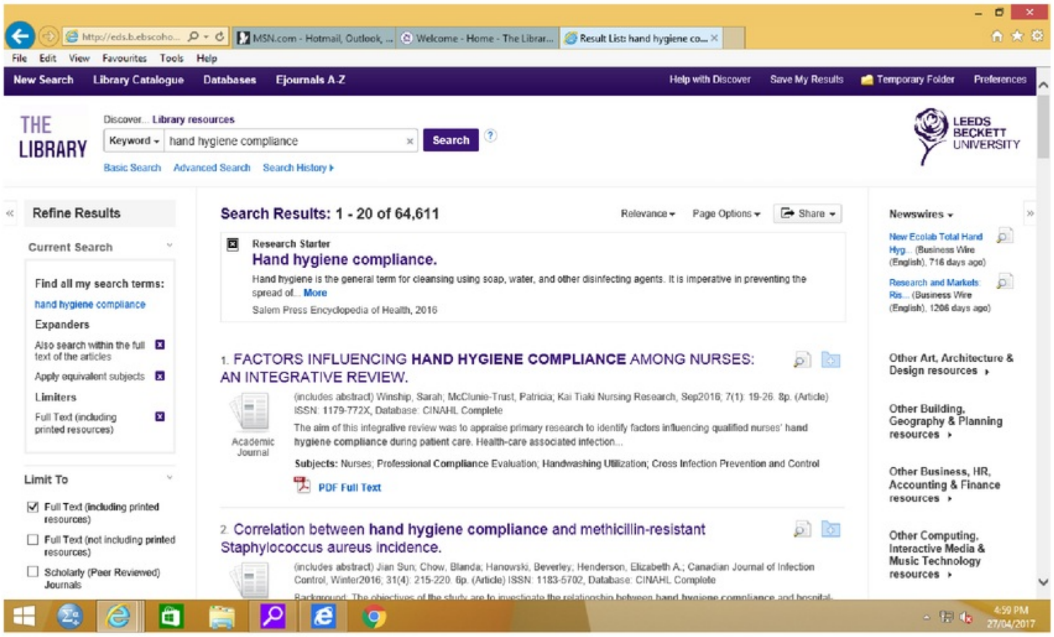
Population/Problem	Intervention	Comparison	Outcomes
1) Health Care Workers in ICU 2) Non compliance to hand hygiene 3) Health Care associated Infections	Improve Compliance of hand hygiene	Compliance And Non compliance	1) Patient safety 2) Improve compliance 3) Reduce Health care associated infections 4) Staff Safety

Steps	Search Strategy
Topics	Improving hand hygiene compliance among health care workers in an Intensive Care Unit
Key terms	'Hand Hygiene', 'Hand hygiene compliance', 'Health Care Workers', 'Health Care Associated Infections', WHO,5 moments of hand hygiene'
Databases	Leeds Beckhett University online library database, Discover. Science Direct. Google search

Steps	Search Strategy	
Databases	Leeds Becketts online database discover + science direct	
Search strategy (1) Using Boolean ‘AND’ To combine different concepts and key words		Hand Hygiene Compliance
	AND	Health Care Workers
	AND	Intensive Care Unit
Search strategy (2) Select a field ‘Ti Title’ To focus on the topic	Hand Hygiene Compliance	Ti Title
	Health Care Workers	Ti Title
	Intensive Care Unit	Ti Title
Expanders	1) Search within full text of the articles 2) Apply related words	

	3) Apply equivalent subjects
Limiters	1) Language: - English 2) Years: - 2009 – 2017 3) Subjects: - Intensive Care Unit hand hygiene Alcohol hand rub Hand washing 4) Scholarly peer review 5) Academic Journals 6) Full text

Screenshots



Keyword: hand hygiene compliance

Refine Results

Current Search

Find all my search terms:
hand hygiene compliance

Expanders
Also search within the full text of the articles ☒
Apply equivalent subjects ☒

Limiters
Full Text (including printed resources) ☒

Limit To
☑ Full Text (including printed resources)
☐ Full Text (not including printed resources)
☐ Scholarly (Peer Reviewed) Journals

Search Results: 1 - 20 of 64,611

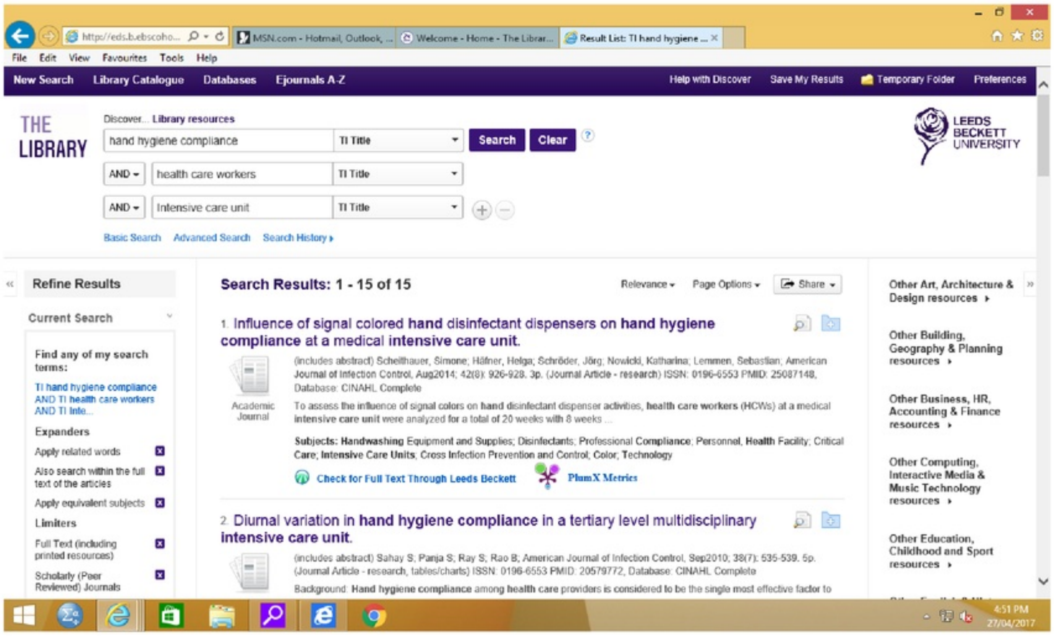
Research Starter
Hand hygiene compliance.
Hand hygiene is the general term for cleansing using soap, water, and other disinfecting agents. It is imperative in preventing the spread of... More
Salem Press Encyclopedia of Health, 2016

1. FACTORS INFLUENCING **HAND HYGIENE COMPLIANCE** AMONG NURSES: AN INTEGRATIVE REVIEW.
Academic Journal
(includes abstract) Winship, Sarah; McClunie-Trust, Patricia; Kai Tiaki Nursing Research, Sep2016; 7(1): 19-26. 8p. (Article) ISSN: 1179-772X, Database: CINAHL Complete
The aim of this integrative review was to appraise primary research to identify factors influencing qualified nurses' **hand hygiene compliance** during patient care. Health-care associated infection...
Subjects: Nurses; Professional **Compliance** Evaluation; **Handwashing** Utilization; Cross Infection Prevention and Control
PDF Full Text

2. Correlation between **hand hygiene compliance** and methicillin-resistant Staphylococcus aureus incidence.
(includes abstract) Jian Sun; Chow, Blanda; Hanowski, Beverley; Henderson, Elizabeth A.; Canadian Journal of Infection Control, Winter2016; 31(4): 215-220. 6p. (Article) ISSN: 1183-5702, Database: CINAHL Complete
Background: The objectives of the study are to investigate the relationship between hand hygiene compliance and hospital-

Newswires
New Ecolab Total Hand Hyg... (Business Wire (English), 716 days ago)
Research and Markets: Ris... (Business Wire (English), 1206 days ago)

Other Art, Architecture & Design resources
Other Building, Geography & Planning resources
Other Business, HR, Accounting & Finance resources
Other Computing, Interactive Media & Music Technology resources



hand hygiene compliance — TI Title
AND health care workers — TI Title
AND Intensive care unit — TI Title

Refine Results

Current Search

Find any of my search terms:
TI hand hygiene compliance AND TI health care workers AND TI Inte...

Expanders
Apply related words ☒
Also search within the full text of the articles ☒
Apply equivalent subjects ☒

Limiters
Full Text (including printed resources) ☒
Scholarly (Peer Reviewed) Journals ☒

Search Results: 1 - 15 of 15

1. Influence of signal colored **hand** disinfectant dispensers on **hand hygiene compliance** at a medical **intensive care unit**.
Academic Journal
(includes abstract) Scheithauer, Simone; Häfner, Helga; Schröder, Jörg; Nowicki, Katharina; Lemmen, Sebastian; American Journal of Infection Control, Aug2014; 42(8): 926-928. 3p. (Journal Article - research) ISSN: 0196-6553 PMID: 25087148, Database: CINAHL Complete
To assess the influence of signal colors on **hand** disinfectant dispenser activities, **health care workers** (HCWs) at a medical **intensive care unit** were analyzed for a total of 20 weeks with 8 weeks ...
Subjects: Handwashing Equipment and Supplies; Disinfectants; Professional **Compliance**; Personnel, **Health** Facility; Critical Care; **Intensive Care Units**; Cross Infection Prevention and Control; Color; Technology
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2. Diurnal variation in **hand hygiene compliance** in a tertiary level multidisciplinary **intensive care unit**.
(includes abstract) Sahay S; Panja S; Ray S; Rao B; American Journal of Infection Control, Sep2010; 38(7): 535-539. 5p. (Journal Article - research, tables/charts) ISSN: 0196-6553 PMID: 20579772, Database: CINAHL Complete
Background: **Hand hygiene compliance** among **health care** providers is considered to be the single most effective factor to

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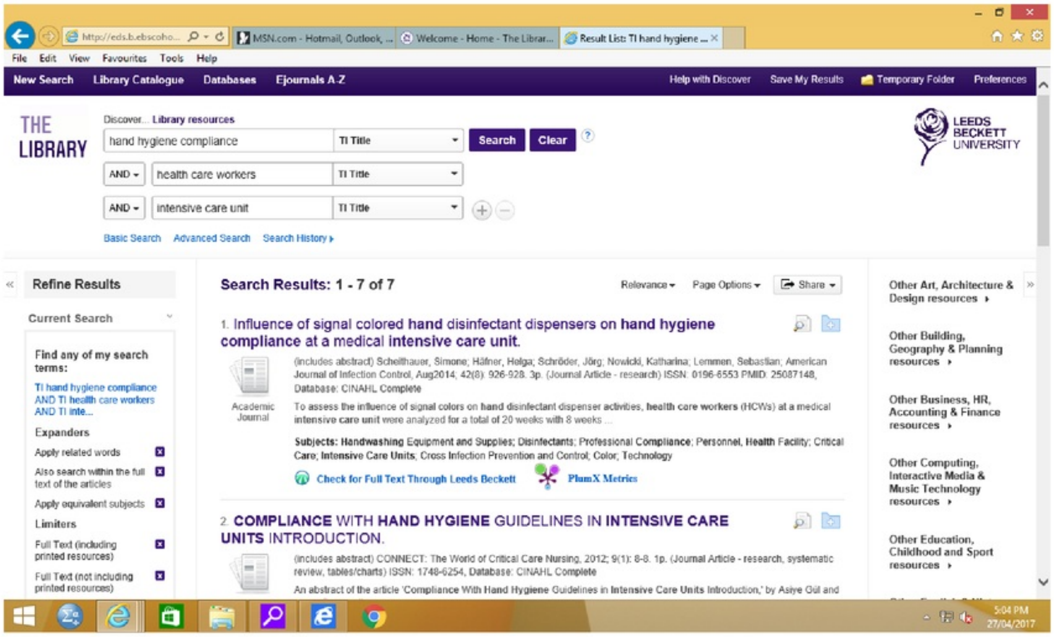
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Academic Journal

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Subjects: Handwashing Equipment and Supplies; Disinfectants; Professional Compliance; Personnel, Health Facility; Critical Care; Intensive Care Units; Cross Infection Prevention and Control; Color; Technology

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2. **COMPLIANCE WITH HAND HYGIENE GUIDELINES IN INTENSIVE CARE UNITS INTRODUCTION.**

(includes abstract) CONNECT: The World of Critical Care Nursing, 2012; 9(1): 8-8. 1p. (Journal Article - research, systematic review, tables/charts) ISSN: 1748-6254, Database: CINAHL Complete

An abstract of the article 'Compliance With Hand Hygiene Guidelines in Intensive Care Units Introduction,' by Asiye Gül and

Research Articles

Articles	1. Influence of signal colored hand disinfectant dispenser on hand hygiene (HH) compliance at a Medical Intensive Care Unit.	2. Diurnal variation in HH compliance level multidisciplinary ICU
Authors	Scheithauer et al	Sahay et al
Publisher	Elsvier Inc	Elsvier Inc
Date of Publication	2014	2010
Methodology	Quantitative Analysis	Observational study
Sample	HCWs	Doctors/Nurses/paramedical staffs
Finding	6 % increase in compliance after intervention	Overall rates of compliances, 66% doctors, 60.7%, nurses 38.6% paramedical staff.
Critical Appraisals	Quality of HH performed could not be assessed	Only one unit studied ,so result cannot be generalised to other unit.

Articles	1. Evaluation of hand washing behaviour and analysis of hand Flora of ICU Nurses	2. Use of ventilator utilization ratio for stratifying alcohol based hand rub(ABHR) consumption data to improve surveillance in ICU
Authors	Findik et al	Wetzker et al
Publisher	Elsvier Inc	Elsvier Inc
Country	Turkey	Germany
Date of Publication	2011	2016
Methodology	Self-reported questionnaire, sample collection (Bag-broth method)	Quantitative analysis
Sample	60 nurses	365 HCWs
Finding	Microorganism on Hand Flora increase post shift	Hand Hygiene compliance is still low in Germany

Critical Appraisals	Over estimation of result while using self-reported questionnaire	Cannot generalized: not all ICUs participate in study

Articles	3. Change in HH compliance after a multimodal intervention among health care workers (HCWs) from ICUs in South Western Saudi Arabia	4. Comparison of HH monitoring using the 5 moments for HH method versus a wash-in wash-out method
Authors	Mahfouz et al	Sunkesulla et al
Publisher	Elsvier Inc	Elsvier Inc
Country	Saudi Arabia	Cleverland
Date of Publication	2014	2015

Methodology	Observation	Comparative Observational Study
Sample	HCWs	283 HCWs
Finding	HCWs more compliant after intervention	Similar Compliance rate for both method used
Critical Appraisals	Hawthorne may affect result	Hawthorne may affect result

	5. Effectiveness of HH promotion strategy using ABHR in 6 ICUs in Colombia	6. Impact of screening and identifying carriers on HH compliance in 4 ICUs
Authors	Barrera et al	Hitoto et al
Publisher	Elsvier Inc	Elsvier Inc
	Switzerland	France

Country		
Date of Publication	2011	2011
Methodology	Prospective Cohort Study	Evaluation Study
Sample	HCWs	HCWs
Finding	ABHR reduce CLABSI	HH can prevent transmission of pathogens
Critical Appraisals	Data lost over time	Costly study

Articles	7. Protection in ventilator associated pneumonia in a mixed ICU after initiation of a novel HH program	8. HH noncompliance among ICU HCWs in Aseer Central Hospital

Authors	Koff et al	Mahfouz, Al-Elgamel and Al-Azraqi
Publisher	Elsvier Inc	Elsvier Inc
Country	Lebanon	Saudi Arabia
Date of Publication	2011	2013
Methodology	Evaluative Study	Direct observation
Sample	HCWs	179 Nurses +34 physicians
Finding	VAP reduced after introduction of program	High rate of HH non compliance
Critical Appraisals	HH compliance increase when using personal HH device	Hawthorne effect may affect result

Articles	9. Adherence to HH in high risk units of a tertiary Core hospital in India	10. Hand washing versus HH in ICU. A clinical trial
Authors	Biswal et al	Hussein and Sajjad
Publisher	Elsvier Inc	Elsvier Inc
Country	India	Iran
Date of Publication	2013	2009
Methodology	Observation	Interventional study
Sample	HCWs in 7 ICUs	17 physicians, 32 nurses, 10 nurses assistant
Finding	HH improve after awareness campaign	HH is better than hand washing
Critical Appraisals	Hawthorne effect may	Small sample size,result

	affect result	cannot generalised

Articles	11. Monitoring the HH compliance of HCWs in a general ICU: use of continuous closed circle television versus overt observation	12. Conspicuous Vs customany location of HH agent dispensers on ABHR product usage in an ICU
Authors	Brotfainn et al	Thomas et al
Publisher	Elsvier Inc	JADA Original Contribution
Country	Israel	Kansas, Wichika
Date of Publication	2017	2009
Methodology	Cross sectional and comparative study	Observation

Sample	HCWs	HCWs
Finding	Compliance rate is high for CCTU. Both methods are reliable	ABHR increase when dispenser is easily seen
Critical Appraisals	Hawthorne effect for overt observation, CCTV is expensive	Hawthorne effect may affect result

Articles	13. Compliance with HH on Surgical medical and neurologic ICUs Direct observation Vs calculated disinfectant usage	14. Does HH compliance among HCWs change when patients are in contact precaution room in ICUs
Authors	Scheithauer et al	Gilbert et al
Publisher	Association for infection control and epidemiology Inc.	Elsvier Inc

Country	Germany	Georgia
Date of Publication	2009	2009
Methodology	Comparative study	Direct Observation
Sample	HCWs	HCWs
Finding	Compliance is 2.75 – fold higher for Direct Observation	Compliance rate is same in both situation
Critical Appraisals	Hawthorne effect may have affect the result	No right shift study perform

Articles	15. Determinant of HH noncompliance in ICUs	16. Assessing the optimal location for ABHR dispenses in a patient room in an ICU
	Alsubaie et al	Boug et al

Authors		
Publisher	ElsvierInc	Biomed central
Country	Saudi Arabia	Netherland
Date of Publication	2013	2013
Methodology	Covert Observation	Quantitative and qualitative
Sample	242 HCWs	HCW
Finding	Overall Observed rate of 58%	The more ABHR dispenser is visible, more it is used
Critical Appraisals	Some opportunities may have been missed	Triangulation method is costly

Articles	Auditing HH practice	17. WHO guidelines on HH in health Care: a summary
Authors	Gould	WHO
Publisher	Nursing Standard	WHO
Country	UK	Geneva
Date of Publication	2010	2009

Appendix 2: Swot Analysis

S Strength	**W Weakness**
1) Support from majority of staff for change received 2) Support from leaders as well received 3) Some facilities are already available 4) Team work approaches already exist. 5) A new charge nurse is acting as Ward Manager.	1) Resistance to change by some staff 2) Cost for implementation 3) Shortage of staff
O Opportunities	**T Threats**
1) Improve safety of patients 2) Improve practice of Health Care Workers 3) Improve the service	1) Resistance to change by staff 2) Limitation of time 3) Failure

Appendix 3: Action Plan

Week	Steps	Action/Intervention	Analysis	Staff
1 - 2	1	Talking about change with peer	Recognise need for change	-Self -HCWs -ICU staff
2-3	2	Documenting	Improve knowledge	-Self
3-4	3	Talk to acting ward manager	- Seek support from leader - Inform about change	-Self -Acting Ward manager
4-5	4	Meeting with - Nursing Administrator - Health Director	- Involving hospital leaders - Ask for permission for change	-Self -Acting Ward manager -Nursing administrator -Health Director
5-6	5	Staff meeting	- Prepare for change - Motivate staff - Communicate need for change	-HCWs -Hospital leaders -self
6-7	6	Documenting - Power point preparation	Preparing Training & Education program	-HCWs -Self

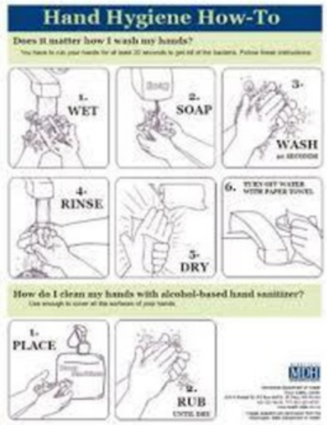
7-8	7	Education and Training program -Awareness campaign	- Power point presentation - Group discussion	-HCWs -Self -Hospital leaders
8-9	8	Evaluation of Building and needs required for HH practices	To know existing facilities to know what is needed for change.	-Hospital leaders -HCWs -Self
9-10	9	Request made by Acting Ward Manager for unavailable needs	Collect items From Government stores Pharmacy and others	-Acting Ward Manager -Self -HCWs
10-11	10	Staff meeting Set team leaders	-Choose volunteers for team leader -Look for resistance, threats and weaknesses	-HCWs -Hospital leaders -self
11-12	11	Team leader meeting Set auditing team	Prepare for implementation of charge	-Team leader - Visitors (Bank Nurses)
12-13	12	Team leader and auditing team meeting	-Prepare for implementation of change -Prepare auditing tools	-Team leaders -Self -Auditor (Bank Nurses)
13-14	13	Trial implementation done for one day	-Assess Possible Drawback	-HCWs -Self

			-Assess performance of auditors -Preparation of unit for charge	-Acting Ward manager -Auditors
14-15	14	Staff Meeting	- Set day for implementation -Persuade staff about charge	-Hospital leaders -HCWs -Self -Acting Ward Manager
15-16	15	Training and education program	-Continuous Education -Prepare staff for change	-HCWs -Hospital leader -Self
16-17	16	Implementation of charge	-Make facilities available -Two auditors in unit per day (as Bank nurses) Direct observation ABHR (Calculation of solution) -Put posters -make all facilities Available for proper HH	-Hospital leaders -HCWs -Self
17-18	17	Team leaders meeting	-Evaluation	-Team leader

		with auditors Prepare a self report questionaire	-Analysing report and data	-Auditor -Hospital leader
18-19	18	Staff meeting Questionaire filled by HCWs	-Analysing questionnaires -Communicate feedback to staff	-Team leader -HCWs -Hospital leader
19-20	19	Education and Training program	Continuous Education program	-Team leader -HCWs -Hospital leaders
20-21	20	New Auditor teams prepared	To prevent Hawthorne effect continuous monitoring	-Team leaders -Visitors or Bank Nurses
21-22	21	Evaluation by team leaders	Compare results	-Team leaders -Auditors
22-23	22	Staff meeting	-Evaluation -Communicate feedback	-Team leader -Auditors -HCWs -Acting Ward Manager
23-24	23	Education and training	-Continuous Education -Additional Education to those	-Team Leaders -Auditors -HCWs -Acting Ward

			who did not perform well	Manager
24	24	-Staff meeting -If charge successful to repeat cycle	Feedback on the 6 month program. Evaluation. Give reward to the 'Champion' of HH	-Team leaders -Auditors -hospital leaders -HCWs

How to do proper hand hygienes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Does it matter how I wash my hands?
1. WET
2. SOAP
3. WASH
4. RINSE
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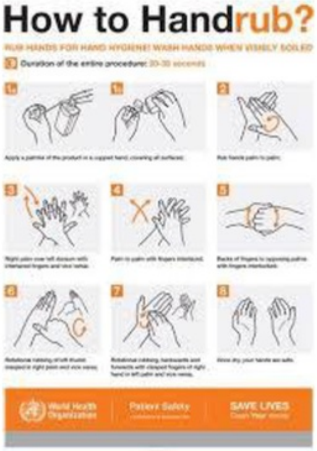
6.
How do I clean my hands with alcohol-based hand sanitizer?
1. PLACE
2. RUB
MDH



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